

SHORT TERM SCIENTIFIC MISSION (STSM) SCIENTIFIC REPORT

This report is submitted for approval by the STSM applicant to the STSM coordinator

Action number: CA15224

STSM title: The Effects of different sources of vitamin D on musculoskeletal development and behaviour of laying hens

STSM start and end date: 16/08/2019 to 10/09/2019

Grantee name: Tahir Shah

PURPOSE OF THE STSM:

This STSM was in continuation to STSM carried out earlier with the aim to investigate the effect of sunlight exposure, feed supplementation of 1,25-dihydroxycholecalciferol-glycosides from *Solanum glaucophyllum* and their interaction in laying hens in the rearing period on behaviour, emotional state and physical health including musculoskeletal development.

DESCRIPTION OF WORK CARRIED OUT DURING THE STSMS

The current STSM was carried out at campus Rodica, Department of Animal Science, University of Ljubljana, Slovenia. I worked under the supervision of Dr. Manja Zupan within the Slovenian national welfare project. This STSM was in continuation to my previous STSM with main focus investigation of the effects of different sources of Vitamin D to reduce bone damage in birds.

Previously we collected data regarding body weight, keel bone status of the pullets at arrival, feather collection for corticosterone, outdoor (direct observation) and indoor (camera recordings) behaviour observations of 15 week old pullets. With this extended STSM I was able to collect indoor and outdoor behaviour data for another two weeks i.e 16th and 17th week old pullets. At 18th week of age we again collected data regarding body weight, keel bone status of the pullets by palpation, feather collection for corticosterone and feather scoring. I learned how to palpate birds for keel bone deviation and fracture from an expert palpator during this STSM. I worked in the laboratory of Veterinair Science Faculty, University of Ljubljana to extract corticosterone from feathers. I also learned the use of BORIS software to decode behaviour observations from recorded videos.

DESCRIPTION OF THE MAIN RESULTS OBTAINED

The preliminary outdoor behaviour (direct observation) results suggest that there was less comfort behaviour in the 1st three days of observation which might be due to adopting to the new environment. Birds with keel bone damage were observed to be in a more alarming state i.e. more head up behaviour with respect to those with no keel bone damage. Birds with vit D as feed supplement and birds with keel bone damage were observed to drink more with respect to those with no vit D supplementation.

Some of the results are contradicting to our hypothesis aswell but we need all the data sets from indoor too to confirm these results. The contradicting results are the birds with keel bone damage showed much more comfort behaviour in outdoor pens with respect to those with no keel bone damage, also the group of birds supplemented with vit D as a feed supplement were at more alarming state (head up) with respect to those with no supplementation.

These are just the preliminary results and we are still under process of decoding the indoor behaviour observations using BORIS software. Corticosterone results from feather needs some time to be analysed in lab too as they are 480 samples. Once we have all the data sets, we could make good comments regarding these observations. I am confident that we will have all the results by the end of November and will publish a good quality paper with acknowledgment to COST action 15224.

FUTURE COLLABORATIONS (if applicable)

This STSM was a great opportunity for me to expand professional networks and we plan to pursue continued collaboration between our two institutions. I believe we were great as a team and will continue to work with this team if provided any opportunity in the future. We already started to write a draft paper on the current work which is planned to be finalized in the coming months. We also plan to work together at the end phase (end of lay) of this project.